

Serial No.: 09/805,216  
Docket No.: HO5-3303/HO  
Page 2

**AMENDMENTS TO THE CLAIMS:**

A complete listing of the claims with an indication of the status of each:

Claim 1. (Canceled).

1      Claim 2 (Currently Amended). An The ink jet recording device according to claim 15,  
2      further comprising:  
3                ~~a head formed with a plurality of nozzles;~~  
4                ~~a converting unit that converts recording data into driving data, the driving data~~  
5                ~~including data sets defining driving pulses for corresponding ones of the plurality of~~  
6                ~~nozzles;~~  
7                ~~a feed unit that feeds a recording medium in a first direction;~~  
8                ~~an ejection element provided to each one of the plurality of nozzles for ejecting an~~  
9                ~~ink droplet from the corresponding nozzle onto the recording medium in response to the~~  
10               ~~driving data while the feed unit is feeding the recording medium in the first direction;~~  
11               ~~a memory that stores nozzle profile data including waveform data and timing data~~  
12               ~~for each of the plurality of nozzles, the waveform data and the timing data indicating a~~  
13               ~~waveform and a generating timing, respectively, of the driving pulse for each one of the~~  
14               ~~plurality of nozzles, wherein the converting unit converts the recording data into the~~  
15               ~~driving data based on the nozzle profile data, and each of the driving pulses is defined by~~  
16               ~~a plurality of data sets of the driving data; and~~  
17               ~~an updating unit that updates the waveform data for each of the plurality of~~  
18               ~~nozzles when a printing condition has been changed, wherein the memory further stores~~  
19               ~~additional data indicating a waveform of the driving pulse, and the updating unit updates~~  
20               ~~the waveform data by replacing the waveform data with the additional data.~~

1      Claim 3 (Currently Amended). An The ink jet recording device according to claim 15  
2      further comprising:  
3                ~~a head formed with a plurality of nozzles;~~

Serial No.: 09/805,216  
Docket No.: HO5-3303/HO  
Page 3

4            a converting unit that converts recording data into driving data, the driving data  
5        including data sets defining driving pulses for corresponding ones of the plurality of  
6        nozzles;  
7            a feed unit that feeds a recording medium in a first direction;  
8            an ejection element provided to each one of the plurality of nozzles for ejecting an  
9        ink droplet from the corresponding nozzle onto the recording medium in response to the  
10      driving data while the feed unit is feeding the recording medium in the first direction;  
11            a memory that stores nozzle profile data including waveform data and timing data  
12        for each of the plurality of nozzles, the waveform data and the timing data indicating a  
13        waveform and a generating timing, respectively, of the driving pulse for each one of the  
14        plurality of nozzles, wherein the converting unit converts the recording data into the  
15        driving data based on the nozzle profile data, and each of the driving pulses is defined by  
16        a plurality of data sets of the driving data;  
17            a designating unit that designates a target ink amount of the ink droplet and a  
18        target impact position on the recording medium on which the ink droplet impacts with  
19        respect to both the first direction and a second direction substantially perpendicular to the  
20        first direction;  
21            a measuring unit that includes:  
22            a first measuring unit that measures a first distance between the target impact  
23        position and an actual impact position on the recording medium where the ink droplet has  
24        impacted with respect to the first direction; and  
25            a second measuring unit that measures a second distance between the target  
26        impact position and the actual impact position with respect to the second direction; and  
27            an updating unit that updates the nozzle profile data based on the target impact  
28        position, the first distance, and the second distance.

1            Claim 4 (Original). The ink jet recording device according to claim 3, wherein the  
2        updating unit includes a first unit and a second unit, the first unit updating the waveform  
3        data of the nozzle profile data so as to change the ejected ink amount of the ink droplet,

Serial No.: 09/805,216  
Docket No.: H05-3303/H0  
Page 4

4       the second unit updating the timing data of the nozzle profile data so as to control the  
5       actual impact position with respect to the first direction.

1       Claim 5 (Previously Presented). The ink jet recording device according to claim 4,  
2       wherein each of the ejection elements ejects a single ink droplet from a corresponding  
3       one of the nozzles in response to a corresponding one of the driving pulses, and each of  
4       the driving pulses includes a plurality of sub pulses which are determined by the  
5       waveform data, wherein adjacent two of the plurality of sub pulses are divided by a split  
6       time.

1       Claim 6 (Original). The ink jet recording device according to claim 5, wherein each of the  
2       driving pulses has a time width which is determined by the waveform data of the nozzle  
3       profile data, and the first unit updates the waveform data so as to change at least one of  
4       the time width of each of the driving pulses, the split time of each of the driving pulses,  
5       and a pulse duty of the driving pulses.

1       Claim 7 (Original). The inkjet recording device according to claim 6, further comprising a  
2       smoothing unit provided to the driving element, wherein the driving element includes a  
3       piezoelectric element and an element driver that controls the piezoelectric element, the  
4       element driver outputting a driving signal to the piezoelectric element in response to the  
5       driving data, wherein the smoothing unit smoothes the driving signal output from the  
6       element driver.

1       Claim 8 (Previously Presented). The ink jet recording device according to claim 3, further  
2       comprising a deflection electric field generating unit and a charging electric field,  
3       generating unit, the deflection electric field generating a deflection electric field in a  
4       space defined between the recording medium and the head, the deflection electric field  
5       having field element in the second direction and a third direction in which the ink droplet  
6       is ejected, the charging electric field generating unit generating a charging electric field in

Serial No.: 09/805,216  
Docket No.: HO5-3303/HO  
Page 5

7       the plurality of nozzles, the charging electric field having a field element in the third  
8       direction.

1       Claim 9 (Canceled).

1       Claim 10 (Previously Presented). The inkjet recording device according to claim 3,  
2       wherein the updating unit includes:

3            a first unit that changes the waveform data, wherein each of the driving pulses  
4       includes a plurality of sub pulses, and adjacent two of the sub pulses are separated by a  
5       split time, and wherein the first unit changes the waveform data so as to change one of the  
6       split time and a pulse duty of the plurality of the sub pulses, thereby changing the actual  
7       ink amount for each of the plurality of nozzles;

8            a second unit that changes the waveform data after the first unit has changed the  
9       waveform data, wherein each of the driving pulses has a time width, and the second unit  
10      changes the waveform data so as to change the time width, thereby controlling the actual  
11      impact position with respect to both the first direction and the second direction, and

12            a third unit that changes the timing data after the second unit has changed the  
13       waveform data so as to control the actual impact position with respect to the first  
14       direction for each of the plurality of nozzles.

1       Claim 11 (Original). The ink jet recording device according to claim 10, further  
2       comprising a smoothing unit provided to the driving element, wherein the driving  
3       element includes a piezoelectric element and an element driver that controls the  
4       piezoelectric element, the element driver outputting a driving signal to the piezoelectric  
5       element in response to the driving data, wherein the smoothing unit smoothes the driving  
6       signal output from the element driver.

1       Claim 12 (Currently Amended). ~~An~~ The inkjet recording device according to claim 15,  
2       further comprising:

Serial No.: 09/805,216  
Docket No.: HO5-3303/HO  
Page 6

3           a head formed with a plurality of nozzles;  
4           a converting unit that converts recording data into driving data, the driving data  
5       including data sets defining driving pulses for corresponding ones of the plurality of  
6       nozzles;  
7           a feed unit that feeds a recording medium in a first direction;  
8           an ejection element provided to each one of the plurality of nozzles for ejecting an  
9       ink droplet from the corresponding nozzle onto the recording medium in response to the  
10      driving data while the feed unit is feeding the recording medium in the first direction;  
11        a memory that stores nozzle profile data including waveform data and timing data  
12      for each of the plurality of nozzles, the waveform data and the timing data indicating a  
13      waveform and a generating timing, respectively, of the driving pulse for each one of the  
14      plurality of nozzles, wherein the converting unit converts the recording data into the  
15      driving data based on the nozzle profile data, and each of the driving pulses is defined by  
16      a plurality of data sets of the driving data; and  
17        a leveling unit that levels generating timings of the driving pulses by changing the  
18      timing data of the nozzle profile data.

1       Claim 13 (Currently Amended). An The inkjet recording device according to claim 15,  
2       further comprising:

3           a head formed with a plurality of nozzles;  
4           a converting unit that converts recording data into driving data, the driving data  
5       including data sets defining pulses for corresponding ones of the plurality of nozzles;  
6           a feed unit that feeds a recording medium in a first direction;  
7           an ejection element provided to each one of the plurality of nozzles for ejecting an  
8       ink droplet from the corresponding nozzle onto the recording medium in response to the  
9       driving data while the feed unit is feeding the recording medium in the first direction;  
10        a memory that stores nozzle profile data including waveform data and timing data  
11      for each of the plurality of nozzles, the waveform data and the timing data indicating a  
12      waveform and a generating timing, respectively, of the driving pulse for each one of the

Serial No.: 09/805,216  
Docket No.: HO5-3303/HO  
Page 7

13        ~~plurality of nozzles, wherein the converting unit converts the recording data into the~~  
14        ~~driving data based on the nozzle profile data, and each of the driving pulses is defined by~~  
15        ~~a plurality of data sets of the driving data, and~~

16            ~~a resolution changing unit that changes a time resolution, wherein each one of the~~  
17            ~~plurality of data sets of driving data having an original time resolution, and the resolution~~  
18            ~~setting unit that sets the original time resolution of each of the data sets to a~~  
19            ~~predetermined time resolution.~~

1        Claim 14 (Original). The ink jet recording device according to claim 13, wherein the  
2        original time resolution determines the waveform of each of the driving pulses, and the  
3        predetermined time resolution determines the generating timing of each of the driving  
4        pulses.

1        Claim 15 (New). An image forming device comprising:

2            a head formed with a plurality of nozzles;  
3            a converting unit that converts recording data into driving data that defines driving  
4            pulses of corresponding ones of the plurality of nozzles;  
5            a feed unit that feeds a recording medium in a first direction;  
6            an ejection element provided to each one of the plurality of nozzles for ejecting an  
7            ink droplet from the corresponding nozzle onto the recording medium in response to the  
8            driving data while the feed unit is feeding the recording medium in the first direction; and  
9            a memory that stores nozzle profile data including waveform data and timing data  
10          for each of the plurality of nozzles, the waveform data and the timing data indicating a  
11          waveform and a generating timing, respectively, of the driving data for each one of the  
12          plurality of nozzles, whercin

13            the converting unit converts the recording data into the driving data based on the  
14          nozzle profile data, the driving data is a sequence of pulse data each corresponding to one  
15          of the plurality of nozzles and each including a plurality of data sets.